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The Late Dr. H. M. Cohen.

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EDITOR'S NOTE.

OUR readers will, we are sure, forgive the omission of that number of the "Journal" which should have appeared in the last quarter of last year. We were faced with the alternative of bringing out a greatly diminished Journal in close proximity to our January number or of omitting it altogether. The latter course seemed preferable and having adopted it we shall start volume 8 in October instead of July of this year. The change was of course made necessary only by the sudden lamented death of the late Editor.

Obituary.

[Sir d'Arcy Power, K.B.E., who was a personal friend, has kindly supplied us with the following notice of Dr. Hyman Maurice Cohen.]

WE record with the deepest regret the death from heart failure on 31st August, 1929 of Dr. Hyman Maurice Cohen the founder, Editor and one of the principal supporters of this Journal. For several years Dr. Cohen had suffered from a high blood-pressure with heart trouble, and had a severe attack at Torquay in August, 1928. In spite of this he continued to work and undertook to act as honorary secretary of the section of anæsthetics at the Manchester meeting last July of the British Medical Association. The additional work overtaxed his strength and he died suddenly to the great grief of his many friends whilst motoring in Derbyshire.

Dr. Cohen was born of Jewish parentage in New York City on Christmas Day, 1875. His father was Maurice Cohen, a merchant (d. 1907) his mother Sarah Cohen. There were five sisters and two brothers. From boyhood he destined himself for military service in the United States Army and for this career he was educated, first at the East Greenwich Military Academy, Rhode Island, afterwards at the Carlisle Military Academy. He then proceeded to the Harvard University, obtained the licence of the College of Physicians and Surgeons at Baltimore and lastly qualified M.D., U.S.A. in 1896. In the same year he obtained a commission in the U.S. Army as Surgeon-lieutenant and after serving at various stations was sent on active service to the Philippines during the campaign of 1898. Here he showed great energy for amongst the distractions of war and the enervation of a tropical climate he studied Spanish and the native language and produced an "English-Spanish Visayan Dictionary."

He resigned his commission in 1913 when he held the rank of Surgeon-Captain and having married on 8th June 1904 Miss Etta Rothband of Manchester found that he had family connections and friends in that city. He determined therefore to settle and practice his profession in England. For this purpose he entered St. Bartholomew's Hospital as an ordinary student, worked diligently, found that he had forforgotten much of the theory of medicine and surgery, was rejected at the College of Surgeons, was not disheartened, presented himself again and was admitted M.R.C.S., and L.R.C.P. in 1916.

Cohen then determined to devote himself entirely to the administration of anæsthetics, in which he already had some experience, and settled in the Palatine Road at Withington, a suburb of Manchester. He soon obtained the appointments of Anæsthetist to the St. Mary's Hospitals and to the Manchester Educational Committee doing good and regular service in both positions. He maintained throughout his life friendly relations with his native country, for he was a corresponding member of the American Society for Regional Anæsthetics and visited the States as a delegate from the British Medical Association on the occasion of the 78th Annual meeting of the American Medical Association held at Wash-

ington. Among his friends in Manchester one of the chief was the late S. R. Wilson and it was in association with him and with Mr. H. E. G. Boyle that the idea of founding a Journal of Anæsthetics for Great Britain was first discussed and the plans for the enterprise laid. Cohen threw himself with enthusiasm into the work, was mainly instrumental in getting together a sound editorial board and started the Journal on a solid basis. With what success he managed it as editor our readers are well aware and they as well as ourselves will realise the difficulty of filling his place, while we hope that also they, like us, will be determined that his labours shall have in the Journal a long enduring memorial.

SOME DIFFICULTIES WHICH MAY OCCUR IN THE ADMINISTRATION OF ANÆSTHESIA FOR CEREBRAL OPERATIONS.

By Z. MENNELL, M.B.

Senior anæthetist St. Thomas' Hospital and National Hospital for Epilepsy, Queen Square, etc.

ANÆSTHESIA for operations upon the central nervous system presents many problems which do not usually arise in the practice of the general anæsthetist. Some of these difficulties occur in other classes of work on the head and neck, but in no single instance are they encountered collectively or call for such close co-operation and mutual understanding between the surgeon and anæsthetist.

In the first place the anæsthetist has to do his work with the head completely covered and far removed from the operation site; this should present no great difficulty to the experienced man and is one of the minor difficulties which can easily be overcome by the use of modern methods—and, after all it is not such a handicap as would appear at first sight, for such guides as changes in the pupils or lid reflexes are usually so disturbed by disease as to be valueless.

People suffering from lesions in the head or cervical regions of the spine are at the best, poor risks for operation; but it is when there is an increase in the intra-cranial pressure in such cases that difficulties and dangers are liable to arise during the course of anæsthesia, more especially so where there is any interference with that pressure. The brain can accommodate itself to a gradual change of pressure but not to a sudden one, such as is so liable to occur during surgical interference. This statement is exemplified in the sudden deaths which occur during lumbar puncture in the presence of posterior fossa pressure and which are due to the so-called "Pressure-cone" interfering with the vital centres in the medulla. The individual to be dealt with is not normal, and will not react in the usually accepted manner under an

anæsthetic and it is in this way the chief problem arises in dealing with them. The lower the intra-cranial pressure the more normally they react, and the slower the onset of the disease the more they have accommodated themselves to the change, and therefore the more they depart from the normal when interfered with.

Intra-cranial pressure varies directly with the blood pressure or appears to do so, but the blood pressure is a totally unreliable guide during anæsthesia as it is frequently impossible to register any pressure owing to the complete absence of the pulse in any accessible artery. So that after taking many hundreds of blood pressure tracings I now prefer to rely upon other signs.

I do not propose to discuss the various anæsthetics used for intra-cranial work as I have already put them on record in the *Trans. of R. S. M. and Amer. Journ. of Surg.* but will confine myself to the method now in use in cases where there is interference with raised intra-cranial pressure.

There are two schools of thought in the surgical world in performing these operations—the rapid and the slow. I have seen both in practice; the former as practised by the late Sir Victor Horsley whose marvellous dexterity (ambidexterity) and speed had to be seen to be believed, and the latter to the recently published accounts of nine-hour operations in America.

Both these are of course extremes, and do not concern us here, as in the former case Horsley rarely if ever cut a bone. flap, and the latter are all done under local anæsthesia, following preliminary medication. Bone flaps are of course a necessity, but I hardly think it is necessary to spend three and four hours removing some bone from the skull without touching the dura. Let us consider the usual case and forget the extreme.

At the National our usual practice is as rapid an induction as possible, the passage of an intra-tracheal catheter and as light an ether anæsthesia as is consistent with the surgical necessities. The catheter is fixed to the cheek with an ordinary towel clip, the tube from the ether container to the catheter is about eight feet long and lies under the

sterilised towels along the patients body. No warming ap- apparatus is used, as whatever the temperature of the vapour when it leaves the ether chamber it is at the temperature of the theatre by the time it reaches the catheter. An expiratory catheter is not used, but an air way or dental prop safeguards the catheter from becoming occluded by the teeth.

This form of anæsthesia is nowadays quite ordinary and it is not necessary to go into detail, but I want to point out how in intra-cranial pressure cases, the course of anæsthesia varies from the normal, and how to overcome the difficulties which may arise.

In the first place no matter what symptoms are present, and they may be very few, the anæsthetist has got to remember he is dealing with an abnormal case. Since there is pressure in the head it follows that the centres in the medulla are interfered with. The pulse may appear normal, in fact it is more often on the slow side, but the respiration is abnormal. Directly the anæsthetic is started the respiration will be found to be depressed and the first difficulty thus encountered In severe cases it is almost impossible to get enough of the anæsthetic vapour inhaled to produce anæsthesia sufficient for any surgical interference or even the passage of an intra-tracheal catheter. As the anæsthetic is pushed so the respiration will get lower until it finally ceases, and on many occasions I have had to request the surgeon rapidly to decrease the pressure by tapping the ventricles before it was possible to pass a catheter.

Owing to the difficulty with the respiration it is inadvisable to use opium or its derivatives before these operations; we always use a full dose of atropine as a routine.

Again, so marked is the depression of the respiration that although ether stimulates the depth, yet on account of the much greater quantity of the vapour needed the difficulties of the induction are so much increased by its use that chloroform is justifiable, and I now use that drug undiluted by any ether. This chloroform has to be pushed and it is often necessary to use two or three layers of a towel over the mask to obtain the requisite depth of anæsthesia to pass the catheter, and when this has been done the actual trouble of induction is over

at once if it is realised that the cyanosis which may occur can very easily be removed by emptying the large veins in the chest by a few "squeezes" and the use of a small quantity of oxygen. Curiously enough carbon-dioxide does not seem to stimulate the respiration to any appreciable degree at this stage, though it is useful later as will be pointed out.

The difficulties described are frequently met with. There is another type of case which is practically unconscious and comatose, and not apparently needing an anæsthetic at all. This condition is nearly always due to extreme pressure and as the surgical procedure is designed to lessen this pressure an anæsthetic may be necessary when it has been done. A properly adjusted air way is all that is necessary with the tube of the intra-tracheal machine attached to it. In this way ventilation under the towels can be secured and on the slightest sign of consciousness returning an anæsthetic vapour can be used without any disturbance.

Another difficulty which has occurred on several occasions is the presence of a very large cerebellar hernia. In such a case it is usually possible to pass the catheter from the side of the mouth without extension of the head; but is has happened more than once that this has been found to be impossible, and then the method adopted for the comatose case has to be used. After induction, the passage of the catheter and subsidence of coughing, the second stage of anæsthesia occurs, and a period of quiescence ensues for the anæsthetist. Anæsthesia will pursue its usual course during the preparation (which will often include the shaving) of the scalp, the manœuvring into position, cutting the flap and removal of bone. From the anæsthetists' point of view an enormous amount of valuable time can be lost here which can ill be spared later and a very light anæsthesia is all that is necessary, just short of coughing and movement sufficient to disturb the position. This is quite easily maintained by the intra tracheal method and without access to the head.

The next surgical procedure is the opening of the dura and this is the first time apart from the induction that difficulties are likely to occur. Blood pressure is liable to be rather higher at this time in consequence of trauma to the head in cutting a bone flap. But directly the dura is opened it will

fall and there is a definite sudden increase in the depth of anæsthesia—hence the absolute necessity of a light anæsthetic and the danger of chloroform at this stage. The reason for this sudden change is probably due to the increased flow of blood through the vital centres in the medulla and consequently the greater quantity of the anæsthetic agent which reaches them. This condition is most marked in cerebellar cases, and can be recognised by the anæsthetist by increased pulse rate and depth of respiration. The same symptoms will also occur when the dura is found to be so tight that before it is practical to open it, the pressure has to be relieved artificially by tapping the ventricle, lumbar puncture in the absence of posterior fossa pressure, or by the intravenous injections of high percentage solutions of saline or glucose.

Should the pulse rate become very rapid and small the surgeon should be warned, the small amount of anæsthetic stopped and pressure be applied directly to the surface of the exposed brain. After an interval the anæsthetic should be again turned on slowly, as coughing at this stage would tear the brain on the edges of the dura, and the pressure slowly removed from the brain. These measures will nearly always restore the blood-pressure—if they do not the anæsthetist has to advise stopping the operation and consequent second stage operation later. It is here that experience is necessary and it is very striking how few secondary operations are now seen at the National, especially since intra-tracheal ether has become a routine.

When this condition has been overcome the anæsthetist enjoys another short period free from anxiety, while exploration of the brain takes place; and it is only when further surgical steps are decided upon that he will be called upon to utilise his judgement. The surgeon will certainly want to know the condition of the patient before he removes a tumour, and the anæsthetist has got to know what the removal of that tumour is liable to involve before he gives his sanction to further manipulation.

Many factors have to be taken into consideration, but first and foremost is the patients welfare and ultimate recovery. A grave risk has always to be taken on his behalf and in justifying that risk the common alternative has to be remem-

bered; life can be of no use with a cerebral hernia, blindness and intolerable headache with perhaps an increasing aphasia and hemiplegia. Also the removal of a tumour may be the only means of replacing the brain and closing the scalp wound.

Generally speaking if the condition is fair i.e. if there is a palpable radial pulse it is best to proceed: some of the most apparently hopeless cases do best.

Pituitary tumours removed by incision of the capsule, breaking up the contents in the capsule and removal by suction do well, but only in the presence of a low pressure; there is no need to stop such an operation because of a soft pulse and low blood pressure. Endotheliomata also do well and the fall of blood pressure on removal can be counteracted by a plug and manual pressure. The subcortical gliomata may lead to serious hæmorrhage which is not easily checked and which may take a long time.

Access to the posterior fossa causes more serious surgical shock than elsewhere and some of these cases may cause the anæsthetist many anxious moments. There is more bleeding to be overcome in the exposure, and any interference around the medulla causes a very serious fall in blood pressure. Unless intra-tracheal ether is used, a constant resort to artificial respiration will be necessary. In reaching the lateral recess for acoustic nerve tumours the radial pulse is frequently impalpable and respiration inaudible and invisible, and yet these cases make the most dramatic recoveries. In such a case the anæsthetist has to rely on the appearance of and pulsation in the brain and upon experience. Directly surgical manipulation is over and the cerebellum replaced the radial pulse returns and by the time the patient is warm in bed the condition is usually very good. Intravenous infusion should not be performed as the patients then die of œdema of the brain. The action of drugs to raise the blood pressure is evanescent and useless. The only drug we use is camphor, preferably in its synthetic form "hexeton." This seems to improve the condition and restores warmth. When restless morphia in small doses.

CO_2 seems to increase the rapidity of recovery by elimination of the anæsthetic due to deep breathing, but the anæsthesia

should be so light by the end of the operation that it is not often necessary.

In conclusion, no anæsthetist who is "au fait" with the use of intra-tracheal ether need be perturbed at the thought of an operation on the brain if he will remember the several points referred to above. Gentleness and speed on the part of the surgeon, a clear air way with intra-tracheal ether on the part of the anæsthetist and knowledge, confidence and calmness in both, spell success in this often difficult and trying work.

THE MENTALITY OF THE PATIENT AND ITS BEARING UPON THE PHENOMENA OF ANÆSTHESIA.

DUDLEY WILMOT BUXTON, M.D., B.S., M.R.C.P.

WE may, I submit, establish a nexus between the hallucinations of unstable minds, dreams, dream visions, and the mental states which occur in association with the use ot drugs such as nitrous oxide, ether, chloroform, morphine, belladonna and so forth.

Probably the study of these states has in the past, and will in the future throw some light upon the phenomena of anæsthesia. We know something about the physical properties of narcotics, a group of drugs in which I include anæsthetics. For example, we have learnt to accept as a safe belief that any given anæsthetic in most cases will bring about a certain definite result. If it does not do this, we say that the recalcitrant individual patient has an "idiocyncracy." An excellent way of expressing the undoubted fact that we do not understand the reason for the abnormality of the phenomena which develop, nor do we appreciate what is the *causa causans* in any particular case.

Anæsthetic agents must be employed and so it is incumbent upon us to increase our knowledge of their action. We can do this, both by experiment and by a closer study of all "recalcitrant" cases. How much is still to be discovered in this matter is evidenced by the fact that medical men as well as their patients recognise the shortcomings of all known drugs and decline to believe that we have as yet reached the shores of knowledge of the *ultima Thule* of anæsthesia.

Hence year by year fresh nostrums, the names of which adorn the ever increasing advertisement lists of the synthetic pharmacist, are added to the armamentarium of the anæsthetist. His methods are legion, he invades the alimentary canal from either end; his argosies enter the blood circulation

by the veins or even by the arteries; and in the theca of the spinal cord he finds a useful dumping ground for his wares. Subdural, subdermal and para-vertebral analgesic methods clamour for recognition. However, during a long life spent in the harrowing harness which an anæsthetist has to wear I have sought all in vain for the ideal anæsthetic and have waited even longer for a peaceful mind when compelled to pilot a patient safely through the narrows between the Scylla and Charybdis of narcosis and yet remain on friendly terms with my friend the operating surgeon. For with the introduction of each new drug and the vaunting of every novel method of anæsthesia, there has come an aftermath of doubt and difficulty, and only too often of danger.

It may be permitted me then, to try to come to grips with the problems involved in giving anæsthetics to all sorts and conditions of men, and if possible to grapple with that bugaboo, safe anæsthesia, and to dispel some of our difficulties by studying them from a less common point of view—the aspect namely of the physical peculiarites of the patient peculiar to his psychology.

It was a commonplace of the past fifty years to sum up the necessary knowledge of anæsthesia as consisting in a nodding acquaintance with the reactions of half a dozen drugs, the physiological effects of which had been worked out by chemists and physiologists who were in many instances devoid of any practical acquaintance with the art of anæsthesia. To this list of nostrums we must add some familiarity with a score or so analgesics vaunted by the manufacturers. Last but by no means least, there were the demands of surgery often including the knowledge, an important point, of what are the limits to which anæsthesia may be carried in order to make possible the operative work plotted by the surgeon. In those far off days, but slight heed was given to the patient's mental condition, his comfort and his hereafter. An operation had to be performed and a competent surgeon was called in to undertake it.

The anæsthesia side of the case was commonly committed to a junior practitioner often with limited experience. He was not allowed to examine his patient before commencing the inhalations, not given particulars about his state or the nature

of the operation. Even in serious cases when an expert was introduced, it was not regarded as necessary that he should be called into consultation with the physician and surgeon in charge or requested to make a thorough clinical examination of the patient, which should have included the mental as well as the physical aspect of the case.

To day much of this is changed. The surgeon is usually a man of extensive knowledge and he regards the anæsthetist as a colleague possessing special knowledge in his field of work. Together they face the supreme problem—The patient. The terms of this problem are: the patient's age; the degree of shock present or likely to be developed; also any intercurrent pathological conditions which may and probably will cause bizarre results arising from the anæsthesia or surgical shock; also the length of time likely to be required by the surgeon for the operation. In cases calling for delicate manipulation "speeding" up by the anæsthetist to lessen the "third party risks" is inadmissable. It is incontrovertible that "insult to tissue" kills at least as many patients as does prolonged manipulation, provided loitering is not practiced.

It emerges from these considerations that the anæsthetist must study the normal effects of the individual drugs of his armamentarium, both as regards quality and quantity; this involves not only the drug but the method by which it is to be administered; how it will react under abnormal conditions such as intercurrent disease, fever and so on—and lastly how the surgeon's manipulations will influence the reactions of the drug he proposes to employ. For example he must be prepared for unexpected hæmorrhage, unusual shock and so on. Armed with this knowledge he will be able to select with some accuracy, the drug best suited for the case, and the most suitable method by which it may be applied. It will be within the cognizance of most of us, that very wide differences occur in the way in which patients, who to the seeming, are physically similar, respond to anæsthetics and further how greatly patients differ in their post-anæsthetic phases.

Admitting these premisses we cannot fail to recognise that physically normal patients may, and do differ from the normal on the psychological side. Here our problem widens and we

find ourselves compelled to study the mental aspects of the patient who has to take or has taken the anæsthetic. The contention is probably true, that a wider knowledge of the mentality of patients enables us to obtain better and safer results in dealing with a large number of patients.

How far physical conditions dominate mental phenomena, we have yet to learn. There is no doubt that such dominance does exist in many instances. Such dominance may be transient or it may persist for a long span of time and further may give rise to unexpected phenomena a long time subsequent to the disappearance of the physical state.

Let me attempt to make this plain by quoting a case which occurred within my personal experience. I was subpœnaed to give evidence at the Sussex Assizes, the case being that of a youth who it was alleged had habitually exposed his person indecently and in such a way as to cause annoyance to women who resided in houses, the gardens of which backed upon the garden of the house where the youth lived with his parents. I studied his family history and ascertained that several members of the youth's relatives were, or had been, neurotics. He was not markedly neurotic nor had he revealed erotic tendencies. However I ascertained that some weeks before the practices complained of had occurred, the youth had undergone an operation and a distinguished anæsthetist had administered the anæsthetic. Although no difficulties were met with at the time, it was suggested that the boy's mentality had undergone some change subsequently, so that at the time of the exposure the boy was not normal. I drew up a report in this sense and stated that in some people an anæsthetic drug—I was dealing solely with such drugs—initiated erotic mania. Usually the attack of this state was brief and transient. I submitted that it was consistent with our knowledge of the psychology of such cases that given a sufficient stimulus, recrudescence of the attacks was well within the realm of probability. At all events the judge accepted my Report and without calling evidence for the defence, dismissed the case.

The point I am anxious to make is that the influence of the nervous system and the mentality of the patient really

dominate the anæsthesia to an extent which is not usually recognised by us. An abnormal state of mind may be called into being by one administration of a powerful anæsthetic, or such a state of mind may be a reawakening of a previous mental state by association with past experiences, through the unconscious ego.

The work of Dr. Crile, which he brought before the meeting of the International Medical Congress in 1913 seems to supply a nexus between mind and matter during anæsthesia. He showed that there is evidence of physical changes occurring in the cells of the nervous system when they come under the influence of blood itself containing drugs, such as chloroform, ether, morphine and so on. "Bombardment" of the brain cells he called it.

The influence excited by these drugs was shown to vary individually, while the length of time during which the influence was exerted also varied. A short anæsthesia in a normal person caused little physical effect and this effect was quite transitory. It is within the range of sound conjecture that when the nervous system is abnormal either through a disease or through a lack of nerve stability, the physical effects and the range of after-effects would be increased and would be a function of the nature of the anæsthetic and the actual amount of it which entered the blood stream and was absorbed by the protoplasm cells. In support of this we know from the work of Victor Horsley in the case of chloroform, that the erythrocytes are capable of this. This means that the fixed cells which are our present concern, and the synapses in the brain are intimately affected by anæsthetics and that the effects are not merely waves of passing action but are capable of prolonged inter-action causing either transient or even permanent effects.

Now we recognise one profound effect of anæsthesia and that is shock. Indeed we know very little of any other effect. However, I submit that we habitually group many quite different results of anæsthesia under the single heading of shock when we employ that term loosely.

Shock due to anæsthesia varies with the particular anæsthtic agent employed. A patient who has inhaled ether for

a very long time shows extreme shock. He "sinks through the bed," is cold, his circulation is feeble, the pulmonary ventilation is poor and he takes an unduly long time to "recover." This, of course, is ether toxæmia, but ether especially when given by an open method and by a person whose slogan is, "ether is so safe, you cannot do harm by pushing it to the *n*th degree," may cause serious and dangerous effects when normal quantities are employed. The point is, however, that even normal people can be, and are profoundly influenced by ether—the effect is a brain effect and indeed such patients develop mental effects such as struggling, frequently maniacal in character both in the stages of "going off" and "coming to." If we compare the above picture with that of chloroform given under similar circumstances we find the chloroformed patient develops shock more rapidly than in the case of the ether patient he will be algid, chalk white, his breathing feeble and gasping and his pulse practically not to be felt at the wrist. However, with suitable remedies he completely recovers and seems little the worse. His return to a normal condition is much more rapid and complete than occurs with the etherised patient. In these cases we are dealing with an effect due to anæsthesia. This how-however is only a slight matter compared with the average dangers and difficulties of the anæsthetic. Given normal brain cells we can by experience limit our dose, an important matter by the way, and so produce anæsthesia and not toxæmia—or it may be death. The problem we have to solve includes under the heading of abnormal, a failing or faulty heart which may mean a starved brain; a deficiency of hæmoglobin with pronounced anæmia; respiratory dyscrasia; fever or some condition which causes the blood stream to convey poisons to the brain. Again, we have to face the effects of constitutional diseases, epilepsy, lymphatism, neurasthenia and so on. These conditions are, however, patent and the careful anæsthetist will have taken stock of their presence, and how far their effects are revealed in the physical and mental states of the patient.

It is the concealed states of mentality which cause trouble, and these are too often not only unexpected but unrecognised when ordinary symptoms develop.

I think that there is little doubt that (i) the brain cells in some persons have inherently poor powers of resisting the effects of anæsthetics and that the anæsthetic produces an effect disproportionately great to the amount inhaled—bizarre results occur during the anæsthesia :

(ii) the resisting power of the brain cells of certain persons is lowered or increased by some intercurrent condition such as a severe hæmorrhage producing anæmia in its diverse forms.

But outside physical conditions with which we are pretty well acquainted and for which we can and do make due allowance in the employment of our methods, there are psychic conditions capable of grave interference with the usual procession of events which occur in the production of anæsthesia. In a way these psychic influences are more important than the physical. They are not so easy of detection before the results of their influence are developed. They are often cloaked by a misleading appearance of physical wellbeing, and they are too often grouped in the mind of the anæsthetist into the category of "hysteria" and as such relegated to those conscious phenomena which it is fondly hoped will disappear when the patient is "under." It may be useful to investigate this psychic side of anæsthesia because the phenomena embraced not only cause difficulties and dangers during the induction of anæsthesia but also during the period of the maintenance of brain unconsciousness and also even into the stage of recovery. Indeed one's experience goes to show that post-anæsthesia effects may persist and for a quite considerable time after operative measures have been completed. In some of such cases the operation may be ruled out as a physical cause of any persistent phenomena and so the psychic influences, which include the anæsthesia, remain as determining agents in provoking the phenomena. I refer to persistent anosmia, amaurosis, various degrees of mania, neurasthenia in its many manifestations, eroticism, all consequent upon some trivial operation which involved a brief anæsthesia or even the use of a local analgesic. Psychic phenomena may result from the reawakening of buried consciousness. It is

well established*now that profound impressions made upon the individual at some period of his life, but which have been buried in the oblivion of years may, and do become revived if an adequate stimulus comes into action. In the present connexion the most important types of case are those associated with fear; "night horrors," indeed all those profound interferences with the psychic which involve terror. It is not a mere figure of speech to speak of "dying of fright." The man to whom Sir James Simpson was to have administered chloroform, the first attempt to produce anæsthesia by that drug, died without an anæsthetic—died of fright. It is certain that some of the cases of death under an anæsthetic when we can eliminate faulty methods and drug poisoning, are deaths from fear. But when a less serious result has followed the inhalation of an anæsthetic, the fear impress on the psyche may be very profound and may involve a genuine terror if revived even after many years. The conscious residuum after a wide interval is, that although nothing untoward may have happened, an abiding dread of operations and anæsthetics remained. If another operation under an anæsthetic has to be faced a repetition of the horrors, the hopeless fear became present and operative as soon as the patient passed into the subliminal state, that is, his consciousness is not of the present in which he was living, but of the awakened past. Nor ought we to consider the patient a neurasthenic, a hysteric or even a weakling. These revived experiences, reawakened memories do undoubtedly react upon the central nervous system with grave import. Reflexes usually in abeyance under an anæsthetic in some cases actually persist in this state and powers of resistance to anæsthetic dangers are markedly lessened, while the control by the brain centres appears to have a much diminished action as compared with the norm. Many persons are inclined to pooh-pooh these statements or regard them as the "fond imaginings of fancy." However, the subject, I think, stands upon a substantial basis and is, I submit, worthy of careful study. We have to explain the extraordinary fact that patients with an unstable nervous

*See the writer's paper "The Psychology of Anæsthesia," *Roy. Soc. of Medicine, Section of Anæsthesia Proc.* Vol, xiii, 1921, pp. 1–14.

system, those liable to nerve storms, to exaggerated responses to slight brain activities reveal a wholly different behaviour under anæsthesia from those possessing a normal nervous system. We must group with these persons those I have mentioned who, under adequate stimuli, reveal psychic phenomena—impressions which have been possibly many years in abeyance. The induction period in its initial stage may not show any departure from the normal but the patient in the later stage is liable to the development of nerve storms, struggles maniacal in type, affecting not only the motor muscles but also the cardiac system and circulation; respiration spasms may develop and may lead to respiratory and cardiac failure.

Not only are perturbations liable to occur as a result of revived mental states, but in the case of many persons who are mentally normal, before passing under the influence of an anæsthetic or analgesic there is a grave danger of a loss of resistive power to the action of the anæsthetic which is being used. I know of instances of cardiac enfeeblement, and even at times of brief collapse when the pulse was lost and respiration was practically in abeyance. These alarming occurrences appeared to be associated with mental exhaustion consequent upon a prolonged period of brooding, of sorrow or mental shock—the unexpected loss of a relative; the discovery that the disease for which the patient was to be operated upon was extremely serious and carried little hope of recovery. It is noticeable that the patients who appear the most calm and self controlled are often subject to these nerve storms and as they pass into the subliminal state. Such storms are more violent and dangerous in the case of those who are obviously emotional, the type of individual who becomes excited and struggles quite from the commencement of the inhalation. Such conditions may and do involve more serious consequences than are commonly associated with them. It is so usual to attribute to "bulk overdose" the untoward events during a period of anæsthesia that the mental aspect of the cases may easily be overlooked. Nerve exhaustion plays a very marked part both in the phenomena of anæsthesia and in those which occur during the period of recovery. Some authorities have gone so far as to insist that the recovery stage and there-

fore the ultimate success of the operation is more satisfactory when the patient does not take a general anæsthetic and a spinal or local analgesia is relied upon. This conclusion is probably arrived at too hurriedly and needs substantiation as well as a close study of environing conditions before we can accept it without reservation. Indeed one of the difficulties with which we are faced in deciding upon such statements is to estimate the character and experience of the person in charge of the anæsthetic or analgesic. He may be a surgeon who, having made a special study of analgesia, takes on the duties usually committed to an anæsthetist or probably to some junior man, *i.e.* the House Surgeon or some busy medical man who possesses no wide experience of anæsthesia and who is unfamiliar with its modern developments. The types of anæsthetists are so widely differentiated by experience of the older and modern methods as to make any comparison between them and their work almost futile. Such matters as nervous-system exhaustion, blood counting and examination of the blood-pressure for some days before the use of the anæsthetic are often regarded as unnecessary refinements save in obviously collapsed patients and they are not even thought of, much less practiced. But not only are such methods of examination of the patient highly important in all cases in which the mental state and general central nervous system are not normal but call for special study and anxious thought because they shed light upon the important questions of dosage and the selection of methods.

The advocates of analgesia are often highly skilled specialists, among specialists, but when one probes the reasons they assign for their preferences and enquire into the less successful results obtained in many instances in their practice we are compelled, perhaps regretfully, to admit that there is no balm even in the analgesic Gilead. And this in many cases is due to the fact that the condition of the patient's nervous system has not been studied or, if studied, the dangers involved in that state have not been recognized and the state of what we may term mental collapse has been brought about by the analgesic method employed.

As a matter of fact analgesia practiced on the conscious but insensitive patient is liable to be a grave danger. Psychic

shock is a peculiar danger in many cases. The modern method of combining general anæsthesia with local analgesia fulfils two requirements, it produces muscular relaxation, thus facilitating the surgical manipulation and it renders the patient unaware of the steps of the operation. It does not, however, entirely abrogate the dangers of psychic shock and certainly some of the untoward symptoms which occur in the early stage of the precedure are due to interference with brain action.

It is commonly said that patients dread general anæsthesia and the fear engendered by anticipation may give rise to dangerous psychic shock. This is certainly true but I have known and have been told of patients who have suffered acutely from dread and fear not only in the preliminary stage of producing analgesia but also during the operation. There was no question about the patient's immunity to pain but there existed the irradicable fear that suffering would develop and if it did so the operation would be continued upon him—the semi-conscious patient. This is, of course, highly unreasonable but we must remember that in very many persons the mental condition is unstable on occasions when the psyche is dominated by fear. In one case I know of the patient had the operation for the relief of hernia—the radical cure—and this was performed under local analgesia. This patient passed into a mental condition of insanity and babbled about the operation. He eventually recovered and was once more quite sane.

In the early days of the use of spinal analgesia the claims preferred for its employment were that some physical disease from which the patient suffered would be made worse by inhalation methods and, indeed such methods might lead to fatalities. With improved inhalational methods and the employment of accessory drugs such as morphine, scopolamine and atropine the number of such cases has become less. Further, we know that death through flooding occurs in spinal analgesia in cases of intestinal obstruction, fatalities in lymphatism are still a danger as well as in other diseased states, many of which are the opprobium of anæsthetists. Unhappily we still have to recognise and deal with cases which are dangerous both from the point of view of inhalation and

analgesia, cases in which the mental dominance of fear controls the situation, is the coign of danger and provides a problem as yet unsolved.

So we are compelled to recognise that there still remain dangers due to anæsthetics and analgesics even when modern methods are adopted, and to admit that there still are met with a certain number of cases which present baffling symptoms and call for precautions which appear empiric. The object of this thesis is to urge that a closer study of the psychic side of the patient will enable the anæsthesist when faced with abnormal persons and extraordinary symptoms to recognise that it is to the central nervous system he must look for enlightenment, and it is the nervous system which demands his heedful care, both as regards the selection of the anæsthetic and the choice of the method to be adopted.

PUBLIC INQUESTS ON DEATHS DURING ANÆSTHESIA.

By H. Bellamy Gardner, M.R.C.S., L.R.C.P.

Late Anæsthetist and Instructor in Anæsthetics Charing Cross Hospital, London.

THE utility of continuing to hold coroners' public inquests on those persons who die while under the influence of anæsthetics is a question well worth debating, as it touches the relations between the public and the medical profession in a very particular manner.

The ordinary man would be somewhat perplexed to answer the question of their abolition offhand because the custom here has existed throughout his lifetime; but if he will reflect upon the following considerations for a few moments it is likely that it may appear to him undesirable to continue the practice in the light of the progress of knowledge and of surgery.

If asked what is the object of an inquest in such cases he will reply "To prevent you fellows from killing us off as often as you please" or some such trifling and thoughtless remark. He has an idea that the anæsthetist is put on his trial to see if he has done his work properly. If he rejoices in such an attitude let him consider that he does not expect or require a trial of the surgeon who has endeavoured to cure him or his relations without success and would find it difficult to give a reason for this curious distinction in the liability of the two qualified medical men.

If he really distrusted either the surgeon or the anæsthetist, or both, to be doing their best to save the lives of their patients, he would long ago have brought actions in the courts for malpraxis on a large scale; but this is, perhaps, one of the rarest accusations known in the list of legal causes.

It may be safely said that the average man does not distrust the doctor who gives an anæsthetic nor the surgeon who operates, but he gives no thought to the consequences

of holding a public enquiry should a patient fail to survive their efforts to prolong his life.

Why then has the custom survived? Because coroners have continued in the belief, or, for other reasons have stated, that a death during anæsthesia is an "unnatural death" and that the law requires an inquest in all such cases.

There is no logic in such a view, for what is "unnatural" in one decade is a common part of life in the next. The voice of the wireless announcer in our homes to-day would have been received with superstitious terror by most of us in 1920. It cannot be "natural" that one doctor should cut a patient open, and take away portions of his anatomy, while another doctor, who gives a soporific to allow this to be done should be regarded as performing an "unnatural" action.

Either of these actions may result in the patient's death, but, according to this interpretation of an antiquated law, the one death is natural and requires no inquest and the other unnatural and must be publicly searched into, though in both cases the action is performed for the one benevolent purpose of saving a man's life.

Before we finish with the aspect of these matters from the layman's point of view, let us see to whom he looks for the detection of unnatural causes of death. It is the medical practitioner, whom the law requires to state by certificate the symptoms and nature of the causes resulting in death. The medical practitioner, whose registration after qualifying examinations, implies sufficient knowlege to define the difference between natural and unnatural deaths. If the medical practitioner expresses doubt in the matter, the registrar may inform the coroner that an enquiry should be made. Yet if a medical practitioner, being actually present with one or more other doctors at a patient's death, while under the influence of a beneficient anæsthetic, and fully cognisant of all the circumstances of this death, certifies its nature and causes for the same purpose to the registrar, his word and knowledge are, by the prevailing faulty custom, set at naught

Either every death following any surgical operation should be the subject of public enquiry or only those in which some real suspicion of malpraxis can be entertained. It is obvious that neither the death of a patient while taking an anæsthetic

nor that following a surgical operation should *prima facie* warrant an enquiry going behind the doctor's medical qualifications.

Having satisfied the law by years of study and the passing of the qualifying examinations, a doctor should be exempt from public trial of his actions when using the well-recognised methods of his profession. Generad anæsthetics, having been in use since 1846, are long past the experimental stage of their employment, and have been generally accepted and extolled as one of the greatest benefits known to mankind.

It is therefore unnecessary to believe that still more precautions, more knowledge, more skill can be attained by the average doctor in the average case requiring anæsthetic administration by threatening him with a public trial if he meet with an event he is unable to avert. We thus approach the investigation of the disadvantages of such public enquiry.

Does it not produce an unjust and distorted opinion of the risks of anæsthesia? Only the fatalities by this means reach the public ear, not the hundreds of thousands of successful and masterly administrations, no details of the resort to exhausting and self-sacrificing methods of resuscitation which so often have prevailed in restoring life; no mention of the doctors who devote their lives to the study of anæsthetics and their advance and improvement. A sordid view is thus encouraged comparable to that from a house near a cemetery where funerals pass at constant intervals.

Fear is one of the most depressing factors in undergoing surgical treatment. Of what use is the headline in the evening newspaper "Death Under an Anæsthetic" to the cringing mortal in hospital or nursing home the night before his operation? Many a time have we seen calm confidence and happy trust converted into questioning doubt and sleepless worry by these reporters' revellings in a subject which should not call for publicity.

Consider the position of the man whose reputation and living depend in his profession solely upon the administration of anæsthetics, when called in to anæsthetise an almost moribund patient, whose only chance of survival is an immediate serious operation. Why should he not refuse to undertake the case if his name is to be the sport of the reporters in the

event of a fatal result? His colleagues are exempt from all enquiry into their conduct and their names are never known in connection with the case at all. We do not know of any instance of his refusal, such is the loyalty of the profession to its ideals; but it is time that the operating surgeons should clear their colleague, the anæsthetist, of this unfair and damaging burden of which he has to bear the whole responsibility.

The statistical mortality of surgical operations, though reduced enormously in recent years, is certainly ten times greater than that of anæsthetics, which is computed at only one in nearly 4,000 of the major administrations. These are facts of which the public and the profession may be justly proud; but they point to no want of skill or teaching of the art of anæsthesia.

For an intimate scientific inquiry into the exact cause of any particular death under an anæsthetic a costly system has been proposed of appointing medical assessors to assist the coroner and jury in their investigation; this would also be undesirable on account of the very slight value of their opinion compared with that of the anæsthetist and surgeon who were witnesses of the occurrence. The fact that the cause of death during anæsthesia is often a number of small adverse factors in combination and not one main factor, such as gross obstruction of the breathing, renders the examination at the post-mortem often unfruitful in locating a cause; but nevertheless it is advisable to resort to a post-mortem examination in every case in order to assist in defining the risks in many pathological conditions.

It appears that many coroners are under the impression that they cannot, by law, order a post-mortem examination without holding a public inquest: but if this be so they should be endowed with this power which would often in other cases save the need and expense of a public inquiry. The coroners themselves are not likely to listen to any reasons for not holding public inquests while their salaries are dependent directly or indirectly upon the number of public inquests that they hold annually; but the Parliamentary Committee on Coroners' Law, which held its sittings for two years and published most exhaustive reports in 1910, recommended that

"every case of death under an anæsthetic ought to be reported to the coroner, whether it occurs in a public institution or a private house. If the coroner on inquiry is satisfied that all due care and skill has been used *we think it undesirable that there should be an inquest.*"*

The Scotch method is the same; report is made to the Procurator Fiscal, who decides in the same manner as recommended by the Departmental Committee just quoted. It has become exceedingly rare for a public inquest to be held on a death under an anæsthetic in Scotland.

This then would appear to be the suitable manner of marking the progress in the general use of anæsthetics for surgery, because it avoids causing fear and misapprehension and does not do away with the right of inquiring into unusual cases.

*Coroners' Committee—Second Report of the Departmental Committee 1910 appointed to inquire into the law relating to Coroners. Part I. Report 1910, Sir Mackenzie Chalmers, K.C.B., *Chairman,* Sir Malcolm Morris, K.C.V.O., Sir Horatio Sheppard, T. A. Bramsden, Esq., M.P., Wm. Willcock, M.D., I. F. Moylan, Secretary.

DEATH DURING ANÆSTHETIC INDUCTION.

By R. W. Hornabrook. M.B., (Melbourne Australia).

OPEN confession is good for the soul—that may be, but it is not with that intention that I am writing these notes. Rather with the desire that others may not fail in the manner that I have.

One afternoon in August, 1929, I was called upon to administer a general anæsthetic for examination purposes to a lady, in the professional rooms of a brother practitioner. It was to be a "mere whiff."

Upon arrival I found my patient, to all appearances, the embodiment of good health, and physically perfect. She was about 30 years of age. Her history was as follows: About four months previously she had a complete suppression of her menses, which, up to that time, had been perfectly regular and normal. She was an unmarried woman and the medical man she consulted naturally informed her that the most common cause for such a condition was pregnancy. Was there any possibility of this in her case? This she (and quite correctly) denied.

Upon arrival at the rooms, I found her already in the lithotomy position. I questioned her and examined her pulse —this was steady, regular, and of good volume. She gave me the impression that she was in no way nervous and the only abnormality that I noted was a huskiness in her voice. It is my routine practice never to induce anæsthesia in a patient in an abnormal position. I am a strong believer that the slightest abnormality may count during anæsthetic induction. However I found on examination of the table that there was no rest for the legs; in other words, that the examination table was only two-thirds of a table, and the legs had to be bent on the abdomen in a lithotomy position. This position has nothing wrong with it as long as the patient does not require to have a

general anæsthetic administered. This position, from experiments carried out upon myself and others, shows the blood pressure to be thrown up from 10 to 25 m.m. (systolic). The intestines, liver and stomach are forced up against the diaphragm and tend to embarrass the heart. In a patient who is conscious this may mean nothing, but in the case of a patient to whom a general anæsthetic is to be administered, this is different. We all know that during anæsthetic induction, under any form of general anæsthesia, there is a marked tendency towards rise of blood pressure. This rise of blood pressure may be the last straw that breaks the camel's back in the case of a patient whose heart is below par. Not only did I attempt to place this patient under a general anæsthetic when in an abnormal position, but I failed in two other respects.

It is my routine to give $\frac{1}{8}$ gr Morphia and 1/150 gr. Atropine in all adult cases before giving a general anæsthetic. I am a very firm believer in this preliminary small dose of Morphia and Atropine in spite of the adverse criticism advanced by some of my colleagues. I do not think that it is the Morphia and Atropine that is to blame in the case of those administrators who claim that it has disadvantages. In this case I did not give Morphia and Atropine because it takes from half to three-quarters of an hour to get the full benefit of the Morphia and Atropine and the examination was wanted at once. In other words, I did not wish to delay either the patient or surgeon. In this I think I was wrong.

My third mistake. I started the induction with chloroform. I did this because it was not my desire to run the risk of bringing on a laryngeal spasm, which I thought might arise in view of the huskiness of the voice that was noticeable when the patient spoke. My desire was to deaden to a certain extent the laryngeal irritation with chloroform before starting upon ether. I put a few drops of chloroform on the mask, which was a Schimmelbusch of *one* layer of flannel. I held the mask about three inches above the patient's face and then very gradually brought it down nearer the patient, so that, in about two minutes, it was about an inch away. The patient had been talking to me, and her last words were "Oh, this is lovely!" Less than half a minute later she suddenly collapsed, like the shutting of a book. There was never at any

time the least sign of struggling or objection to the anæsthetic. There was no question about it—her heart had failed and she was dead.

For two hours we tried every means to restore life, for two hours artificial respiration was kept up and a tube was passed into the larynx and oxygen administered. Massage of the heart was not attempted. In neglecting this, I may be open to criticism, but it appeared to me too cold-blooded and I do not know of any authentic case that has really survived this treatment. Maybe the electric needle as recommended by Dr. Lidwell, and by which means he saved a new born infant, might have done something and set the heart going again, but I doubt it.

The following are the notes as supplied by the pathologist who made the post-mortem examination :—

"The body was that of a well made young woman, five feet seven inches in height. The face was livid—there was an abrasion over the heart.

The heart was enlarged, especially the right ventricle, which was distended with dark fluid blood, its wall was thin, the orifice of the right coronary artery was narrowed, the cavity of the right ventricle was much dilated.

The left lung was adherent to the chest wall, there was a patch of old fibrosis and consolidation at the left base with dilated bronchi containing pus. The right lung was normal. There were some remnants of the thymus, the thyroid was small. The liver was rather firm, the spleen was large and the follicles prominent. The stomach contained air, the intestines were normal. The mesenteric glands were slightly enlarged. The kidneys were firm, their capsules were adherent and their surfaces were sub-granular. The pancreas and suprarenal capsules were fairly normal. The uterus was small, not pregnant, it contained a few small fibroids—there was a small cyst on the left ovary. The brain was normal.

Death was due to cardiac dilation and right heart syncope under the anæsthetic."

I am strongly of the opinion that this patient might not have collapsed if I had not broken through my practice. This is the first case in over thirty-three years of anæsthetic work that I have lost during induction or upon the table, and I

certainly think it ought not to have occurred. It was bad work, or rather, should we not say, a grave error of judgment. It is the small details that count in anæsthetic induction, and I neglected mine.

If the patient had been quietly placed in the lithotomy position after induction, it would not have mattered, but to induce a patient in that position, especially one who, from the history given, might be in a state of nervous instability and whose heart might be below par, was almost criminal. There is also one other point, and that is, we are not giving our patients a square deal when we give them "whiffs" in professional chambers and not on the operating table of a nursing home.

I trust that these few notes will prevent those who follow after me from making the mistake that I have. We say that it is by our errors we learn—maybe this is true—but, let us remember that we can never regain a life once lost. Maybe my patient had cardiac fibrillation—this is possible. It is also possible that the death would have occurred under any circumstances. It does not, however, excuse me from slacking up in my precautions and breaking through my routine.

[In a covering letter sent with the above notes Dr. Hornabrook, who is to be congratulated on his candour and courage, makes a remark that is pertinent to the contribution which we print from Mr. Bellamy Gardner: Dr. Hornabrook writes:—" I wish that we had some better method than we have at present of reviewing our anæsthetic fatalities. The present method of inquiry by coroner's inquest I think is absolutely valueless from a scientific standpoint. The medical man is on the defensive from the start of these inquiries and it is almost impossible to get at the full truth."]—Ed. B.J.A.

A NOTE OF THE BRITISH MEDICAL ASSOCIATION'S MEETING.

By H. P. Fairlie, M.D.

It was fitting that the British Medical Association's Meeting in Manchester should include an Anæsthetic Section. Some of those present doubtless looked back to the Nottingham meeting, at which Dr. S. R. Wilson figured so prominently, and deplored his absence from this meeting in his own town. It was his desire and intention to have had some interesting material ready for presentation on that occasion. The President, Dr. A. L. Flemming, in his opening remarks gave fitting expression to the general feeling of the Section in his tribute to the memory of our late colleague. Indeed no anæsthetist who knew Wilson can visit Manchester without recalling and deploring the loss of that interesting personality.

Now alas we have to grieve for the loss of yet another Manchester anæsthetist, Dr. H. M. Cohen, who was an Honorary Secretary of the Section, and to whose hard work and good organisation the meetings owed much of their success. It comes as a terrible shock, I feel sure, to all who took part in the Manchester meeting to hear so soon afterwards of his tragic end.

It would be superfluous to print the papers which were read at Manchester as they either have appeared or will appear in the *British Medical Journal*. Rather it is the writer's purpose to attempt to give a general impression of the meeting. One of the most gratifying features was the uniformly large attendance, at no time did the numbers fall below forty, and during the earlier stages of both day's proceedings there were considerably more than that number. Manchester and the north of England were naturally well represented, but it was interesting to note the presence of members from centres as far removed as Bristol and Aberdeen, as well as a few from

the U.S.A. The second day's proceedings were largely contributed by the last mentioned. Drs. Pitkin and Kelly drew the largest audience to hear their papers on Spinocain, more than a hundred assembling for the purpose. This number included Mr. Burgess, President of the Association, and several members of the Surgical Section. If Dr. Pitkin depicted a very rose-coloured prospect for Spinocain Dr. Kelly hit the correct note in hinting that trial and experience would ultimately place it in correct perspective.

Other recent developments in anæsthesia were discussed including Avertin, Ethylene, and the use of Glucose in relation to Anæsthesia. One lady member contributed to the programme an interesting paper on Rectal Anæsthesia in Brain Surgery, but we missed another which had been promised, on the subject of urinary changes following anæsthesia. An American visitor gave practical demonstration of what the cinema can do in the teaching of anæsthesia and Mr. G. Edwards showed a film depicting the use of Avertin. Mr. H. E. G. Boyle described the uses of "gas and oxygen" in labour. It is plain that with the necessary encouragement from gynæcologists a great deal more can be done than is customary to render a confinement painless.

If a critical note can be struck it is at the amount of material to be discussed in the short time available. It might, perhaps, have been an advantage to utilize the afternoons as well as the mornings. Apart altogether from the formal business one could not help feeling the benefit of such a meeting in the informal contacts and talks which it promotes.

SECTION OF ANÆSTHETICS.

(Royal Society of Medicine).

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The first meeting of the season was held on November 1st, when Mr. Ashly Daly took the chair, the President unfortunately being too ill to attend. Mr. Daly referred gracefully to the houour which had been conferred on a past president of the section, Sir Francis Shipway, and to the satisfaction with which his colleagues knew that during His Majesty's operation for empyema, the anæsthetic administration had been entrusted to Sir Francis' competent hands.

A discussion on *Avertin Anæsthesia* was then opened by Dr. J. Blomfield and Sir Francis Shipway. The former dealt with the general principles of the subject and described briefly the simple technique. The dosage he employed was 0.1 grm. per kilo of body-weight and he was, he said, a strong believer in the advantage of supervising the injection personally so that the patient's susceptibility could be observed and the amount injected controlled in accordance

with symptoms produced, for body-weight was after all only a rough guide. With avertin, as with other similar drugs, there was great difference in the way different patients reacted to the same dose. The corneal reflex was not the same guide to depth of narcosis that it was with inhalation anæsthetics. In one third of his cases no further anæsthetic had been needed. In the others, either "gas oxygen" or ether or CE mixture, generally only in minute quantities, had been necessary for full relaxation. There was generally a slight fall of blood pressure and a quiet form of respiration, the breathing being both slower and more shallow than in the conscious subject; unconsciousness continued on the average for about two to four hours. Both induction and awakening were pleasant and free from excitement and there was no vomiting unless additional anæsthetics had been required. The speaker had usually given omuopon gr. ⅓ an hour before the avertin but had come to prefer the omission of this except in unusually robust or in alcoholic subjects. He discussed a fatality which occurred in his own practice eighteen hours after the removal of a large thyroid tumour and another, the detailed report of which had been given to him. This concerned a healthy young man who was operated on for an inguinal hernia and Dr. Blomfield could offer no explanation of it if the account was correct, for the dose had been small and the symptoms at the time so contrary to those of overdose that gas oxygen had been needed in addition. Yet the patient failed apparently to eliminate the avertin and died after some hours and gave *post-mortem* no evidence of where the fatal defect was to be found. The speaker said that his most satisfactory experiences with avertin had been with (1) feeble subjects operated on for carcinoma of the stomach; (2) exophthalmic goitres; (3) patients who had previously disliked intensely or been made very sick by other forms of anæsthesia.

Sir Francis Shipway spoke on the basis of a series of 106 cases. He had at first used the solid form of avertin but in the great majority of his patients the fluid preparation had been used. He laid stress on the importance of testing the purity of the solution with congo red before injecting it. He found that a strength of 2.5 per cent avertin in distilled water gave a more even absorption and more gradual induction than the three per cent solution which he had at first employed. But he preferred the stronger solution in the case of children, as the smaller quantity of fluid injected is more likely to be retained by them. Sir Francis regarded avertin as safe if used in doses recommended by Prof. Eicholtz, i.e., not more than 0.1 gr. per kilo in healthy persons and a weaker dose than that for the debilitated. He had never seen excitement during induction. Sixty-six of his patients were males of ages from 12 to 72; the 48 females ranged in age from 15 to 66. The patients were given morphine and atropine, or morphine and scopolamine beforehand.

Habits, occupation and environment must all be taken into account in attempting to determine the dosage, for body-weight alone was an unscientific guide. The alcoholic, the active and the highly strung person react relatively badly to avertin. He had used avertin in 17 abdominal operations including gastrostomy. In twenty of his cases avertin had been sufficient by itself. In 31 cases "gas oxygen" was used in addition and in 10 ether was added to this. Three were given chloroform and ether and one was given chloroform alone, after the avertin, for removal of a growth of the tongue by diathermy. Induction he had found to be quite smooth and usually rapid—so rapid, in fact, that unconsciousness sometimes came on in the middle of a sentence. The patient should be placed on the side, as a precaution against mechanical obstruction of the breathing through occlusion of the upper air passages. The patients had all remained of a good colour and Sir Francis had hitherto had no need of a respiratory stimulant. If one should be needed he considered carbon-dioxide to be the best. After avertin injection the pulse rate was slightly increased, and the blood pressure fell about 10 mm. of mercury; the maximum fall that he had observed was 30 mm. The corneal reflex was generally just present, but in 10 patients it had been completely absent. Among tests of depth of anæsthesia on which he relied, were the application of picric acid or iodine to the operative area, the application of towel clips to the skin, and depression of the lower jaw. Analyses of the urines of his patients that had been made revealed no albumen or blood. One man who had been operated on for inguinal hernia and had been given "gas oxygen" in addition to avertin developed a subsequent bronchitis.

Sir Francis did not advocate washing out the rectum after the use of avertin. The unconsciousness following operation was not of a heavy kind and the patient could be aroused for any purpose, e.g., to take fluid, and afterwards relapsed into sleep which lasted sometimes as long as twelve hours. In the one fatal case of his series there were good reasons for not holding the avertin responsible; a fatty heart and cirrhosis of the liver were found *post-mortem*. Sir Francis valued avertin as an excellent basis for anæsthesia and especially free from after-effects. It was contra-indicated for patients having a rapid fall of blood pressure and for people with renal disease. Otherwise it was the most delightful and peaceful method of anæsthesia induction that he had seen.

In the discussion that followed, Dr. James Young (Edinburgh) referred to his experiences in 150 cases of avertin anæsthesia, and corroborated the previous remarks as to its value for induction and for a quiet time after operation. He valued the method particularly for gynæcological cases because of the freedom from after-sickness which was so detrimental to success in some plastic operations. After operations on the pelvic floor vomiting was very likely to burst the

stitches. He thought that it was important to reduce the preliminary morphia as far as possible.

Mr. I. N. Lewis regarded avertin as most effective in what might be called sub-thyroid persons. In the super-thyroid people, on the contrary, there was greater resistance to its action and they recovered more quickly. It was possible that a higher metabolic rate hastened the elimination of the drug. He was about to undertake experiments to test this matter and the influence of thyroxin on the reaction to avertin.

Mr. C. Hope Carlton suggested that in the patients with Graves' disease, who were well suited by avertin, perhaps the bromine in that drug compensated for the absence of iodine in the patient.

Mr. Geoffrey Keynes had been very satisfied with the anæsthesia produced by avertin, in association with local infiltration of the abdominal wall, in the case of gastrectomy. For gastrostomy he preferred a local anæsthetic only.

* * *

At future meetings of the section the subjects for disucssion, amongst others, are "Anæsthesia in protological surgery" and the "Administration of anæsthetics for the surgery of the thorax."

ABSTRACTS.

The contra-indications of local anæsthesia by novocaine or allied substances. (*Revue de Stomatologie*, July 1929, pp. 411 etc.

Professor J. Vegrassat points out the dangers of local infiltration at the level of or in the immediate neighbourhood of the damaged part which is to be operated on. He is alluding solely to that method of infiltration along all the planes that the knife will traverse of which Reclus has made himself the champion exponent. It is a method of anæsthesia applicable only to slight procedures, removal of small tumours, the surgery of the skull, excision of superficial veins, amputation of fingers and toes, etc., but it becomes dangerous the moment that it is employed to operate on inflamed parts which are to be rendered insensitive by injections in their neighbourhood. Chronic or acute affections of the gums, pyorrhœa and abscesses of the bone must not be operated on under a local anæsthesia obtained by injections of novocaine, or the like, made in the immediate neighbourhood of the infected tissues. It must not be forgotten that what determines the evolution of an infection is as much, if not more, the state of the tissues as the virulence of the infecting organism. It was Pasteur himself who declared on his death bed, "the microbe is nothing; it is the soil which is everything." Novocaine and its allies infiltrated at the periphery of an abscess, or of any inflammatory site, separate and soak the tissues, above all the cellular tissue. Moreover the circulation, already impeded by the pressure of the injected solution, is further inhibited chemically by the special pharmaco-dynamic action of the anæsthetic. The capillaries are contracted and the phagocytosis becomes inoperative. It follows that the infiltrated tissues in contact with the inflamed area become an excellent soil for the extension of the infective process. On the other hand the anæsthetic solution, antiseptic though it may be, is immediately infected at the contact of the septic zone. In a word, to make an injection for local anæsthesia near or next to an inflamed area is to paralyse the defence. It is so obvious a truth that it does not seem worth stating, were it not for the action of many practitioners when they wish to incise purulent collections. Here is an example. A man with double mastoid disease was operated on by two excellent surgeons. But they used local anæsthesia with novocaine. In consequence of the operation, in spite of a free opening of the mastoid, the temperature rose and there was extreme pain in the neck below the sterno-mastoid. A bilateral abscess developed in this region. It was necessary to incise the muscle for its whole

length to the back of the neck. The patient recovered but long cervical scars remained. When local anæsthesia is misapplied in dentistry it may lead to fatal results. When a tooth is extracted under a general anæsthetic, or with none at all, the wound heals rapidly; after a local anæsthetic it may remain open for two weeks, six weeks or even months, healing after finally discharging little sequestra detached more by the action of the anæsthetic than by that of the forceps.

Local anæsthesia carried out in the presence of pyorrhœa for tooth extraction can let loose extensive suppurations of the maxilla or the gums. This osteomyelitis is accompanied by acute pain, fever and general symptoms which can take a disquieting turn. Among numerous cases of the kind which have come to the author's notice one struck him particularly because it had a fatal termination. This concerned a healthy man of thirty-six with good teeth but slight pyorrhœa of the molars. None of the teeth showed signs of caries. They were discoloured from constant smoking. In January 1922, being seized with pretty bad neuralgia in the left lower jaw and feeling the second molar a little tender, he persuaded a dentist to remove the tooth, although he demurred at first because the tooth appeared healthy. The extraction was done under local anæsthesia from novocaine. Two days later there were rigors general malaise and a serious condition. The author saw the patient and found all the signs of general septicæmia; rapid pulse, temperature 39.7°C. Locally, the left submaxillary region was swollen, the gum red and the alveolar wound discharging a little hæmato-purulent liquid. Intravenous injections of collargol quelled the rigors, but the temperature did not return to normal. All the teeth of the left lower jaw had to be removed, giving vent to veritable jets of pus. In spite of a long submaxillary incision the bone was invaded little by little throughout its length, both right side and left. After complaining of his head for some days the patient became somnolent and died. He had succumbed to sinus thrombosis. This maxillary infection was let loose by novocaine infiltration in a pyorrhœic focus. All such cases do not, fortunately, end in tragedy, but many only recover after much suffering and painful treatment. Infitration must be practised only on healthy gums.

Intra-tracheal ethylene-oxygen anæsthesia. H. R. GRIFFITH. (Montreal). *Canadian Medical Association Journal,* Vol xxi. No. 3.

Dr. Griffith has evolved a technique which has proved satisfactory in a long series of cases. He has employed it successfully in (1) tonsillectomies both for adults and children; in some instances the operation lasted more than an hour: (2) for mastoid operations. Long operations were carried out on a series of small, very frail

children who suffered following an epidemic of measles. At the other extreme of age a man of seventy with very extensive mastoid infection who was an alcholic with myocardial degeneration, was kept under for two hours with intra-tracheal ethylene and made a rapid recovery. (3) Septum, antrum and other sinus, eye, face and brain operations. The congestion of nasal mucous membrane is much less than with ether anæsthesia. (4) Thyroidectomies. Patients have been kept under for three hours without any need for additional ether.

The patients are usually prepared with morphine gr ¼ and hyoscine gr. $^{1}/_{150}$ one hour before operation and another hypodermic of morphine gr. ⅙ half an hour later. Children often have no preliminary medication. Anæsthesia is induced with nitrous oxide and ethylene and, if necessary, some ether. The head is then thrown back for intubation and a Jackson's speculum of suitable size pushed in to expose the larynx. Great care is taken not to damage the posterior wall of the pharynx or to break the upper incisor teeth. A silk or lisle catheter of suitable size is introduced and in an adult pushed down about 22 centimetres from the teeth. This brings it about three centimetres above the bifurcation of the bronchi. In the meantime ethylene is turned on into a small bag to which is atached an ordinary irrigator nozzle. This is at once attached to the end of the catheter projecting from the mouth and the anæsthesia is thus continued. A mouth-gag is adjusted to prevent any possibility of the patient biting the intratracheal catheter, the speculum is removed and the patient is placed in position for operation. The catheter is large enough nearly to fill the trachea. Griffith uses all types from F16 or 18 for infants, up to F32. The catheter must be large enough to prevent inhalation of much air around it. On the other hand a catheter that is too large may irritate the larynx, especially in children. A good deal of re-breathing is done into the small bag to which the catheter is attached and even when the patient is completely covered the depth and rate of respiration can be estimated by a hand kept on this bag. The bag may be greatly distended without the pressure becoming dangerously high but as an extra precaution a mercury manometer is on the machine, set to blow off at 20 mm. Relaxation is more satisfactory than with nitrous oxide. The patient is awake immediately after the operation and nausea seldom occurs. The consumption of ethylene is from three to four litres (less than one gallon) per minute. With small children it may be as little as one and a half litres. After twelve hundred administrations there has been no accidental explosion. No grounding device has been employed but a little water is introduced into the rubber tubing and into the re-breathing bag. Foregger "metric" and "safety" have been the machines used. The anæsthesia is both started and finished with nitrous oxide and the addition of carbon dioxide still further reduces the explosion hazard. The

exhaled ethylene soon becomes so dilute in a well ventilated room that it will not explode and an electric suction machine, properly shielded, has been run within a few feet of the patient. Near the patient's face the exhaled gas is the right mixture for explosion so no cautery or openflame or spark is allowed in the operating theatre during the use of ethylene. There is no hyper-secretion of mucous from ethylene as there is with ether. Pulmonary complications have been entirely absent. There was in one case an acute laryngitis. The method is especially valuable in operations on children.

Spinal Anæsthesia in genito-urinary surgery. New England Journ. Med., September 19, 1929, pp. 563 et seq.

No branch of surgery has more frequent need to escape the disadvantages of inhalation methods. Damaged kidneys with varying degrees of uræmia, hearts defective through age or toxæmia, arteriosclerosis, senile changes, so commonly involved in urological problems offer particular arguments in this field against the use of ether. During the year 40 cases have been managed with spinocain. During the night preceding operation, sedatives are given and every effort is made to secure restful sleep. In the actual preliminary medication morphine gr.¼ is given one and a half hours before operation and repeated in suitable dose, according to the effect produced, one hour later. After the first administration all preparations should be completed, the room darkened and the patient's ears plugged. The spinal injection is made before entering the theatre. When the patient returns to bed after operation hypodermoclysis is given beneath the fascia lata in the front of the thighs in a field still anæsthetic. Narcosis is continued as long as necessary to maintain physical and nervous comfort. With these arrangements the authors find no mental hazard in spinal anæsthesia. Ephedrin-novocain solution (1 c.c.) is put into the skin before the spinal needle. In cases with very low blood pressure two ampules are used instead of one. Puncture is made usually between the second and third lumbar vertebræ, but for operations on the kidney the first lumbar interspace is preferred. The patient is in the lateral position with the side to be operated on uppermost when renal and ureteral lesions are involved. The table is slightly tilted with the head downwards and the patient is not permitted to raise the head until the close of operation. The 2 c.c. ampule of spinocain used as a routine produces anæsthesia for about one and a half hours; 3 c.c. have been used for extra long cases. The 2 c.c. spinocain are diluted, in the average case, with 4 c.c. spinal fluid. The greater the dilution the longer and the less intense is the anæsthesia. Directly following the withdrawal of the needle the table is tilted into a Trendelenburg position varying in degree with the desired level of anæsthesia. A

twenty degree angle gives an effect reaching the umbilicus, a ten degree to the costal border, and a five degree to the nipple line. The length of anæsthesia varies directly with the amount of spinocain used. Four cases were not completely successful. There has been no headache, restricted slight nausea, and infrequently vomiting during operation. The writers have not found lowering of blood pressure. The greatest advantage they find is the absence of distention and ileus afterwards. Post-operative pulmonary complications are diminished but there is no immunity to pulmonary infections and one patient was lost in this way. The authors find no difficulty in nuetralizing the blood pressure by the use of ephedrin. In operations on the ureter they have found evidence suggesting that there is a contracture of this structure under spinal novocain analagous to that which has been described in the bowel. There has been no evidence of diminished diuresis or depression of kidney function.

The dependence of the action of novocaine on the kind and reaction of its solvent. Schmerz Narkose-Anæsthesia, September 15, 1929, pp. 203 et sq..

Work on the interference with the action of local anæsthetics by the addition of alkali has recently been taken up again by Requier in France and Trevan and Brook in England. Gissel has instituted fresh experimental work to prove the influence of the reaction of the solvent on the effects of novocaine. Gros believed, as the result of his work in which the sciatic of the frog provided the test, that he proved that the base of a local anæsthetic was more effective than its salt. Further, that the anæsthetic potential of the salt of a local anæsthetic depended on (*a*) the anæsthetic potential of its base and (*b*) the degree of its hydrolytic division. The hydrolysis of a salt however is easily influenced by the addition of alkali. Eros showed that the alkaline solution of novocaine with high content of free base worked six times more strongly than the salt. He advised Sod.-bicarb. 1.2, Novocaine 2, Aq. dest. 100.

Lawen and Heineke, from clinical experiments, arrived at the formula: Sod. bicarb. puriss 0.5, Sod. chlorat 0.3 Aq. dest. 100. The sodium bicacb. and the sod. chlor. were to be disolved in cold distilled water, the novocaine added in appropriate quantity. Braun stated that he could never satisfy himself either experimentally or in practice that novocaine bicarbonate worked any better than novocaine chloride and he disapproved entirely of the novocaine phosphate also recommended by Gros.

The significance of the H-ion concentration for watery solutions of local anæthetics.

Requier has studied the effect of H-ion concentration on the action of cocaine. He finds that the solutions of cocaine on sale are acid,

about *p*H 3.2. Addition of alkali with various H-ion concentrations increased the effectiveness. Up to *p*H 7 there is only slight increase but with *p*H 8.4 it is seven or eight fold. Nevertheless cocaine solutions with alkaline reaction are not tenable since decomposition sets in and the decomposition products have no anæsthetic action.

Hoffmann and Kochmann have experimented on the augmentation of novocaine effect by the addition of calcium sulphate. They find that a $^1/_{10}$ per cent of novocaine-calciumsulphate solution is the equivalent of a ½ per cent novocaine solution.

The introduction of quinine salts into local anæsthetics in order to prolong the analgesic effects originated in America and has been followed in Germany. A preparation known as eucupin is especially effective for this purpose. An addition of 0.1 per cent eucupin is made to the usual novocaine solutions.

The employment of acid and alkaline novocaine-suprarenin solutions in lumbar anæsthesia.

Hitherto the solutions employed for lumbar anæsthesia have shown acid reaction. Braun recommends the use of tablet solutions with the method of Campbell, of New York. Novocaine-chloride is disolved in 3 c.c. of the liquor and re-injected. Kopranek employing a similar method reports favourably on 4500 cases.

Percain, a new local anæsthetic. Norkose und Anæsthesie, No. 6, 1929, pp. 168–173.

The Society of Chemical Industry have produced in their Basle laboratory a new drug which meets many long felt needs. In the last few years hundreds of local anæsthetics have been tested, of which the majority had to be rejected. The new substance is ten times as effective as cocaine. A new method has been followed in the preparation of this new drug. A beginning was made with quinine and the new preparation is a quinoline derivative and belongs to a group related to natural quinine and containing other valuable drugs, atophan, *e.g.* bromoform and yatren. This new substance percain is diethyl-ethylene-diamide of *a*-butyloycinchoninic acid. It is readily soluble in water but no alkali must come into contact with the solution and glass free from alkali must be used. Percain is compatible with adrenalin. If enough doses are given by mouth under the skin or into a vein symptoms of intoxication arise and are followed by violent convulsions and rapid breathing. If pushed further the drug will cause paralysis and death. The respiratory centre is paralysed only in the terminal stage. The dog is weight for weight more tolerant of percain than the rabbit and withstands 0.1 gr. per kilo in 1 per cent solution, which is fatal to a rabbit. No local irritation is caused, a solution of 1 per cent bringing no redness

or œdema to the eye of a rabbit. Experimentally, testing reflexes 1 in 1000 percain acting for 1″ has about the same effect as 1 : 1000 cocaine acting for 30″. Percain is somewhat more toxic than cocaine but it is used in ten times smaller doses and even then is more effective and it has a long period of action. Percain has a powerful action on mucous membranes.

Choice of anæsthesia. New England Journal of Medicine. Sept. 12, 1929, p. 507.

After a brief description of the characteristics of the different anæsthetics the authors go into the criterion of choice in detail. Preliminary narcosis they regard as a valuable aid to all anæsthetic agents. There is no sharp line between narcosis and anæsthesia. "Different states of the sensorium may be produced which vary all the way from a healthy perceptible dulling to an effect so profound that it amounts to a complete anæsthesia of considerable depth. In its present stage of development, however, this latter state appears to be somewhat dangerous. A state somewhere between these two extremes is a great help to a patient having regional or spinal anæsthesia." The barbituric acid derivitives are specially useful where local anæsthetics are to be used, as they exercise a protective influence against the convulsive toxic action of an overdose. Magnesium sulphate has just the opposite effect, rendering the patient more susceptible to this action. It should not be used with regional or spinal analgesia. In respiratory diseases although regional or spinal anæsthesia appear preferable to nitrous oxide or ethylene theoretically, practice does not show this. In kidney disease if ether is used the authors state that it should be preceded by morphia as this "largely inhibits the injurious renal vaso-constricting effect of ether. Young adults require the largest doses of the various anæsthetic agents to produce anæsthetic and toxic effects, while patients in the two extremes of life require the least. Infants are especially susceptible to anoxæmia. For abdominal uses the authors generally prefer spinal analgesia. With the desperate risk cases they choose field block and ethylene with enough oxygen to prevent anoxæmia. For the head and neck they choose reginal anæsthesia or else intratracheal ethylene and nitrous oxide.

Deutschh Medicine Wochft., September 27, p. 1645.

Van der Porten of Hamburg questions the recommendation of Fühner to give alcohol by the mouth before administration of chloroform. It is based on experimental observations on the mouse which led Fühner to state that the damage from chloroform is due not to chloroform itself, but to its decomposition products. These he maintains are avoided by preliminary dosage of alcohol as with 100 to

150 gr. port wine. Porten's opinion is in consonance with that most widely held among British anæsthetists, that the only road to perfect safety with chloroform is not to use the drug at all. If it is used he believes it should be in mixture with ether rather than after alcohol.

The *Indian Medical Gazette* (August 1929) contains an article on avertin rectal narcosis by A. R. Poducal who has studied the method at Eppendorf. He is enthusiastic about the results of avertin injection, which he employs in the dosage of 0.08 to 0.1 gr. per kilo of body-weight. He does not aim at full anæsthesia from avertin alone.

REVIEWS.

"Outlines of Dental Science; Vol. III. Dental Local Anæsthesia." By JOHN JAMES, L.D.S., (Eng.). E. & S. Livingstone. Price 7/6.

THIS short work does not claim in any way to replace the larger text-books on Local Anæsthesia. The arrangement of the subject matter is good and one readily follows the author in his presentation of it. Certain points are controversial, but in a book written to present "outlines," direct statements as to technique, drugs etc. are valuable especially when made as a result of experience. In Chapter II there is no mention of pliers among the instruments, nor is this invaluable tool referred to in Chapters V, IX when discussing complications such as broken needles. The precaution of having ready to hand some such instrument may mean all the difference between success and failure in retrieving a broken fragment in the event of an accident of this sort, where it is especially important that the actual position should not be lost sight of.

The illustrations of bony specimens Figs. 9, 10, and 15 could be considerably improved, the position of the foramina being left rather too much to the imagination. In Figs. 5 and 6 depicting upper central incisors it would be more useful to have them shown in the normal anatomical position especially as the direction of travel of the blade of the excavator Fig. 5 (a) would hardly do what is suggested, nor could the instrument be easily used in such a manner with an adjacent tooth in situ.

The relation of the pulp chamber to the general outline of the crown of the tooth might also be amended. The technique described for the various injections follows the usual lines but in the summary of the intra-osseous method on page 162 damage to the tooth might be included with alveolus, nerves, blood vessels, etc.

On the whole a very readable book, which should be of value to the busy practitioner who wishes to revise the subject quickly, and to the student as an aid to understanding the essentials.

H. Stobie

Practical local anæsthesia and its surgical technic. ROBERT EMMETT FARR, M.D., F.A.C.S. Henry Kimpton, London; pp. 611, 210 engravings and 16 plates; 2nd edition; price 42/- net.

This book first appeared six years ago. The present edition has been revised and enlarged and contains a still greater number of illustrations than the original volume. These are of excellent quality

but like all illustrations for local analgesia they make the parts and the procedure appear more cut and dried and easier than they are ever found to be in actual practice. There is no better portion of this excellent work than that which deals with the general principles to be observed by those who hope to employ local anæsthetics with success. Successful use of this method demands, as the author points out, far more from the surgeon, and from all of those who come into contact with the patient, than the simple injection of the anæsthetic.

All the accessories of an operation assume a double importance when the patient is conscious. No surgeon can hope for success without general anæsthesia if he fails to bear in mind throughout the sitting the psychological effect on the patient of anything that is happening, the importance of his bodily as well as his mental ease, and the necessity for such scrupulous gentleness in all contact with tissues as is rarely bestowed upon them in the unconscious patient. With regard to the safety of local anæsthetics the author, whose predilection is for one per cent novocain, points out the essential precaution of never injecting into a vessel instead of into the tissue. He gives some interesting examples of the effects that may follow this accident and of those that may follow arterial injection without the appropriate compression. The author is convinced that the surgeon who depends on local analgesics for his anæsthesia in operating must be his own anæsthetist, and few anæsthetists, we imagine, will disagree with him. Farr uses the term "narco-local anæsthesia" to designate the combination of local anæsthesia and "twilight sleep." He remarks that music is a valuable adjunct in these cases but gives no directions as to its quality or the time at which it should be employed. We can imagine the strict necessity for ascertaining the patient's taste in music beforehand, if it is to be employed as an anodyne, for nothing could be more discomforting to the semi-conscious lover of Debussy, for example, than to be exposed to a severe selection from the works of Wagner! Under the name psycho-local anæsthesia he describes the method of superimposing general upon local anæsthesia by what might be very properly termed camouflage. The patient is not really anæthetized but is induced to think that he is. Suggestion of course plays a large part in this process. As regards preliminary narcotics the author thinks that their true rôle is to tide the patient over the hours preceding operation, and their dosage should always be so restricted as to make danger from them impossible.

J.B.

A LETTER TO THE JOURNAL.

TOLEDO, OHIO.
November 7th, 1929.

"The British Journal of Anæsthesia,"
Manchester, England.

Gentlemen,—"The British Journal of Anæsthesia" has suffered two serious handicaps in the loss of Dr. Cohen and Dr. Wilson; coming so close together, it is hoped that the editorial board will not lose heart but rise somewhat vigorously to the occasion, lest the Journal may be suspended.

Anæsthesia needs the British Journal and we, as financial contributors in the form of advertising stand ready to do what we can, to support the publication.

We are very glad to learn that Dr. J. Blomfield has been appointed editor, and we hope and believe that he will carry the support and co-operation of anæsthetists in perpetuating the paper. We wish him and the Journal every success.

Yours very truly,

Toledo Technical Appliance Co.
E. I. MCKISSON.